



# METAL INDUSTRY INDICATORS



October 1997

## Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

Although the early reading from the primary metals leading index shows a decline in September, the domestic metal industries should continue to grow in the coming months. The other four metal industry leading indexes increased in August, the latest month for which they are available. The metals price leading index growth rate moved higher in August, indicating the possibility of higher prices for some metals early next year.

The **primary metals leading index** dropped 1.2% in September, to 125.9 from a revised 127.4 in August. The index's 6-month smoothed growth rate, a compound annual rate that measures the near-term trend, moved down to 4.3% from a revised 7.5% in August, the highest growth rate for this index in over 3 years.

Three of the four available index components declined in September. Most of the decrease in the index was attributable to the Purchasing Managers' Index and the S&P stock price index for diversified machinery. However, a decline in the growth rate of the Journal of Commerce metals price index also pushed the leading index lower. The fourth available component, the average workweek in primary metals establishments, was unchanged at 45.1 hours, equaling the longest average workweek recorded for the primary metals industry by the Bureau of Labor Statistics.

The September primary metals leading index should be considered preliminary because only four of eight components were available and a 1-month decline in the index is not sufficient to signal a slowdown in industry activity. Moreover, the decline in the index will likely be reduced as the other components become available. The latest trend shown by the 6-month smoothed growth rate of the leading index points to continuing modest growth in the domestic metal industries over the next few months.

In August, the **steel leading index** climbed 1.5% to 106.3 from a revised 104.7 in July, the largest 1-month percentage increase in almost 4 years. The August 6-month smoothed growth rate of 5.4% is also the highest rate since April 1994. About one-half of the increase was attributable to the length of the average workweek in steel mills, as that component increased by 1.1 hours to 45.4, a level exceeded by only two months on record. Relatively large increases in the industrial production index for automotive products and the growth rate of inflation-adjusted U.S. M2 money supply accounted for most of the rest of the August increase in the steel

leading index. The leading index suggests that the domestic steel industry is likely to experience modest growth in the months ahead.

The **aluminum mill products leading index** edged up 0.1% in August to 144.6 from a revised 144.5 in July. But, the index's 6-month smoothed growth rate slipped to 3.6% from a revised 4.0% in July. The aluminum mill products leading index was held back by sizable drops in construction contracts and new orders for aluminum mill products, despite strong gains in the automotive production and deflated money supply components. The growth rate of this leading index, however, still suggests that the U.S. aluminum mill products industry will grow moderately in the near future.

The **primary and secondary aluminum leading index** jumped 2.1% in August, up to 246.3 from a revised 241.2 in July. The index's 6-month smoothed growth rate rose to 10.6% in August, its highest rate since November 1994. But, the outlook for the domestic primary and secondary aluminum industry is less positive than the exceptionally strong growth rate in the leading index suggests. Two components that contributed to the large August increase, the LME cash closing price for primary aluminum and the S&P stock price index for aluminum companies, retreated from their August gains in September. Also, imports will likely continue to satisfy much of U.S. demand for primary aluminum, so domestic activity will probably grow only modestly. (Tables and charts for the primary and secondary aluminum indexes are in a separate file.)

The **copper leading index** inched up 0.2% in August to 121.9 from 121.7 in July, while the index's 6-month smoothed growth rate held steady at 1.4%. Among the index's six components, the largest gains were registered by the ratio of shipments to inventories for electronic and other electrical equipment and average weekly overtime hours worked in copper rolling and drawing mills. However, a sharp drop in the growth rate of the LME spot price of

primary copper held down growth in the leading index. In August, the capacity utilization rate for primary copper was 97.7%, the highest since 1969. The copper leading index and capacity constraints for primary copper suggest that growth will be slow for the U.S. copper industry in the coming months.

## Metals Price Leading Index at 3½-Year High

The leading index of metals prices increased 0.6% in August to 97.5 from an upwardly revised 96.9 in July. The last time this index was that high was December 1993. The leading index's 6-month smoothed growth rate advanced to 3.5% from 2.5% a month earlier. An unusually strong gain in the growth rate for the deflated M2 money supply, its highest rate since early 1987, accounted for all of the August increase in the index. The other two components available for the August index calculation, deflated new orders for U.S. nonferrous metals and building permits for new housing units, declined. The remaining index component, the

growth rate of the Organization for Economic Cooperation and Development total leading index, is available only through July, but it posted its highest growth rate since July 1994.

The growth rate of the deflated value of nonferrous metal products inventories held in the United States continued rising in August, up to 4.0% from a revised 2.6% in July. This indicator serves as a rough measure of changes in the supply of nonferrous metal products in the United States.

Although, the metals price leading index, which is designed to be an indicator of future demand, has posted healthy increases in the past 2 months, increasing inventories in the United States and on the London Metal Exchange imply that most metal prices will probably experience little or no growth in the short term. It is important to recognize that the business cycle and inventories are only two factors in price determination. Other factors that affect prices include changes in metals production, speculation, strategic stockpiling, and production costs.

An explanation of the indexes and the 6-month smoothed growth rates appears on page 12.

**Table 1.**  
**Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices**

Six-Month Smoothed Growth Rates						
	Leading Index of Metal Prices (1967=100)	MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982\$)	Primary Aluminum	Primary Copper	Steel Scrap
<b>1996</b>						
August	95.3	-20.9	10.6	-15.6	-33.3	-5.8
September	94.6	-26.8	10.9	-23.5	-37.6	-1.3
October	94.6	-21.1	9.2	-16.6	-31.7	-13.3
November	94.9	2.1	6.3	-2.8	11.8	-26.3
December	95.1r	-6.9	5.3	-2.0	-11.2	-21.8
<b>1997</b>						
January	95.9	6.4	-0.2	9.8	6.6	-6.6
February	96.5	11.0	-0.9	12.7	10.5	3.7
March	96.6	10.4	-3.7	10.1	11.2	-3.3
April	96.3	9.7	-3.7r	10.8	12.2	-8.5
May	95.9	18.3	-4.9	11.0	30.7	2.0
June	95.9r	15.1	-4.4	5.1	25.8	3.4
July	96.9r	16.1	2.6r	21.0	3.4	11.6
August	97.5	4.7	4.0	4.6	-12.5	13.6
September	NA	1.1	NA	9.3	-15.9	4.6
<i>r - Revised</i>						
<b>Note:</b>	The components of the Leading Index of Metal Prices are the 6-month smoothed growth rates of the following: 1, the deflated value of new orders for nonferrous metals; 2, the OECD leading index, total; 3, the index of new private housing units authorized; and 4, the deflated value of U.S. M2 money supply. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metals and nonferrous metal products. Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.					
<b>Sources:</b>	U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); the Bureau of the Census; and the Organization for Economic Cooperation and Development (OECD).					

Link To:

Chart 1.

**Table 2.**  
**The Primary Metals Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>1996</b>				
October	119.9	1.5	109.0	4.5
November	120.2	1.7	108.7	3.4
December	121.3	3.1	109.0	3.5
<b>1997</b>				
January	121.4	2.9	109.1	3.0
February	122.6	4.2	109.7	3.5
March	123.7	5.3	109.9	3.3
April	124.1	5.4	110.5	3.7r
May	125.3	6.7	110.4	3.1
June	125.5r	6.3r	110.8r	3.2r
July	126.1r	6.5r	110.7	2.5r
August	127.4r	7.5r	111.9	4.1
September	125.9	4.3	NA	NA

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 3.**  
**The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month**

<b>Leading Index</b>	<b>August</b>	<b>September</b>
1. Average weekly hours, primary metals (SIC 33)	0.7r	0.0
2. S&P stock price index, machinery, diversified	0.2r	-0.4
3. Ratio of price to unit labor cost (SIC 33)	0.0	NA
4. JOC metals price index growth rate	0.0r	-0.2
5. New orders, primary metals, (SIC 33) 1982\$	-0.2	NA
6. Index of new private housing units authorized by permit	-0.1	NA
7. Growth rate of U.S. M2 money supply, 1992\$	0.5	NA
8. Purchasing Managers' Index	-0.2r	-0.6
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.9r	-1.2
<b>Coincident Index</b>	<b>July</b>	<b>August</b>
1. Industrial production index, primary metals (SIC 33)	-0.2r	0.3
2. Total employee hours, primary metals (SIC 33)	-0.3	0.8
3. Value of shipments, primary metals, (SIC 33) 1982\$	0.3	-0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-0.1r	1.0

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, Center for International Business Cycle Research, Bureau of Labor Statistics, and Federal Reserve Board; 4, Journal of Commerce; 5, Bureau of the Census and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

*NA: Not available      r - Revised*

**Note:** A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

Links To:

Chart 2.

Chart 3.

**Table 4.**  
**The Steel Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>1996</b>				
September	101.9	-1.3	98.6	1.6
October	101.3	-2.2	98.9	2.0
November	102.0	-0.9	98.2	0.3
December	102.8	0.5	98.7	1.1
<b>1997</b>				
January	103.2	1.1	99.3	2.1
February	103.9	2.4	99.0	1.2
March	104.4	3.2	99.2	1.4
April	104.2r	2.5r	99.6r	1.9
May	104.2	2.4	99.6	1.4
June	104.9	3.5r	99.5	1.1
July	104.7r	3.0r	99.6r	1.0r
August	106.3	5.4	100.6	2.9

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 5.**  
**The Contribution of Each Steel Index Component to the Percent Change  
in the Index from the Previous Month**

<b>Leading Index</b>	<b>July</b>	<b>August</b>
1. Average weekly hours, blast furnaces and basic steel products (SIC 331)	-0.1	0.7
2. New orders, steel works, blast furnaces, and rolling and finishing mills, 1982\$, (SIC 331)	0.0	-0.2
3. Shipments of household appliances, 1982\$	-0.3r	0.0
4. S&P stock price index, steel companies	0.2	0.2
5. Industrial production index for automotive products	-0.4r	0.5
6. Growth rate of the price of steel scrap (#1 heavy melting, \$/ton)	0.1	0.0
7. Index of new private housing units authorized by permit	0.0	-0.1
8. Growth rate of U.S. M2 money supply, 1992\$	0.0	0.5
9. Purchasing Managers' Index	0.3	-0.2
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	-0.2r	1.4
<b>Coincident Index</b>		
1. Industrial production index, basic steel and mill products (SIC 331)	0.1r	0.2
2. Value of shipments, steel works, blast furnaces, and rolling and finishing mills (SIC 331), 1982\$	-0.1	-0.2
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	-0.1	0.9
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.0r	1.0

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey; 4, Standard & Poor's; 5, Federal Reserve Board; 6, Journal of Commerce and U.S. Geological Survey; 7, Bureau of the Census and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

*NA: Not available      r - Revised*

Links To:

Chart 4.

Chart 5.

**Table 6.**  
**The Aluminum Mill Products Industry Indexes and Growth Rates**

	<b>Leading Index</b>		<b>Coincident Index</b>	
	<b>(1977 = 100)</b>	<b>Growth Rate</b>	<b>(1977 = 100)</b>	<b>Growth Rate</b>
<b>1996</b>				
September	140.5	3.6	125.4	4.6
October	137.6	-0.8	123.8	1.8
November	139.7	1.9r	124.4	2.5
December	140.5	3.0	124.5	2.5
<b>1997</b>				
January	141.4	3.9	123.0	-0.2
February	143.5	5.9	125.5r	3.1
March	143.5	5.1	126.8	4.6
April	144.1	5.2	125.4	2.0
May	144.3	4.8r	125.2r	1.4r
June	144.1	4.0	126.8r	3.5r
July	144.5r	4.0r	125.2r	0.5r
August	144.6	3.6	125.4	-0.6

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 7.**  
**The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month**

<b>Leading Index</b>	<b>July</b>	<b>August</b>
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)	-0.3r	0.1
2. Index of new private housing units authorized by permit	0.0	-0.1
3. Industrial production index for automotive products	-0.5r	0.6
4. Construction contracts, commercial and industrial (square feet)	0.4	-0.6
5. Net new orders for aluminum mill products (pounds)	0.1	-0.4
6. Growth rate of U.S. M2 money supply, 1992\$	-0.1	0.6
7. Purchasing Managers' Index	0.4	-0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.1r	0.1
<b>Coincident Index</b>		
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)	-1.5r	0.9
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)	-0.3r	0.0
3. Shipments of aluminum mill products (pounds)	0.5r	-0.8
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-1.2r	0.2

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Federal Reserve Board; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted.

*NA: Not Available      r - Revised*



Links To:

Chart 6.

Chart 7.

**Table 8.**  
**The Copper Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>1996</b>				
September	118.7r	1.0	113.7r	2.5r
October	119.2r	1.5	114.8r	3.9r
November	121.0r	3.9r	113.3	1.0
December	120.2r	2.1r	114.3r	2.5r
<b>1997</b>				
January	120.2	1.9r	113.8r	1.4r
February	122.0	4.2r	114.1r	1.7r
March	123.5r	6.1r	113.7	0.8r
April	121.8	2.7r	114.2r	1.3r
May	122.7r	3.9r	113.5r	0.1r
June	122.8r	3.6r	114.3r	1.2r
July	121.7	1.4	113.3r	-0.6r
August	121.9	1.4	114.1	0.6

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 9.**  
**The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month**

Leading Index	July	August
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.4	0.3
2. New orders, nonferrous and other primary metals, 1982\$	0.4r	-0.1
3. MII stock price index, copper companies	0.0	0.1
4. Ratio of shipments to inventories, electronic and other electrical equipment (SIC 36)	-0.4r	0.4
5. Growth rate of the LME spot price of primary copper	-0.5	-0.4
6. Index of new private housing units authorized by permit	0.0	-0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	-0.9	0.2
<b>Coincident Index</b>		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	-0.1r	-0.1
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	-1.7	1.4
3. Copper refiners' shipments (short tons)	1.0	-0.7
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-0.7r	0.7

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Bureau of the Census and U.S. Geological Survey; 5, London Metal Exchange and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3 and 5 of the leading index.

*NA: Not available      r - Revised*

Links To:

Chart 8.

Chart 9.

## Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930's. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.<sup>1</sup>

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

Three of the metal industry coincident indexes, those for primary metals, steel, and aluminum mill products, reflect their classifications in the U.S. Standard Industrial Classification (SIC). The SIC is the main classification used by the United States government and industry in collecting and tabulating economic statistics. Two of the coincident indexes, one for copper and one for primary and secondary aluminum, are blends of two different copper and aluminum industries, respectively.

Of the five metal industries, primary metals is the broadest, consisting of twenty-six different metal processing industries. The steel, aluminum, and copper industries are parts of the primary metals industry.

The metal industry leading indexes turn before their respective coincident indexes an average of 9 months for primary metals, 8 months for steel, and 7 months for copper. The average lead time for the leading indexes of aluminum mill products and primary and secondary aluminum is 6 months.

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<sup>1</sup>**Business Cycle Indicators, A monthly report from The Conference Board** (March 1996).

The leading index of metal prices, also published in the Metal Industry Indicators, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 7 months in advance.

The growth rate used in the Metal Industry Indicators is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[ \left( \frac{\text{current value}}{\text{preceding 12-month moving average}} \right)^{\frac{12}{6.5}} - 1.0 \right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below -1.0% usually means declining growth.

**The next summary is scheduled for release on MINES FaxBack at 10:00 a.m. EST, Friday, November 21. Access MINES FaxBack from a touch-tone telephone attached to a fax machine by dialing 703-648-4999. The address for Metal Industry Indicators on the World Wide Web is: <http://minerals.er.usgs.gov/minerals/pubs/mii/>**

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